

FAUNA OF THE CHILKA LAKE.

FISH.

*PART III.*

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(With 2 text-figures).

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## FISH. (PART III).

By B. L. CHAUDHURI.

This part contains a systematic treatment of the suborders Percosoces and Plectognathi of the order Teleostei. The total number of specimens examined and recorded is 373. They belong to twenty species. Of these one (*Sphyraena raghava*) is new to science. The twenty species fall into nine genera and seven families.

### Suborder PERCESOCES.

#### Family SCOMBRESOCIDAE.

#### Genus BELONE, Cuvier

#### *Belone strongylura*, Van Hasselt.

1803. *Esox* sp. (*Kuddera A.*), Russell, *Fish Vizag.* II, p. 61, pl. clxxvi.  
1823. *Belone strongylura*, Van Hasselt, *Alg. Konst. Letterbode*, p. 131.  
1823. *Belone strongylura*, *Id.*, *Bull. Ferussac Zool.*, p. 374.  
1830. *Belone caudimacula*, Cuvier, *Reg. Anim.*, p. 234.  
1846. *Belone caudimacula*, Cuvier and Valenciennes, *Hist. Nat. Poiss.*, XVIII, p. 452.  
1846. *Belone caudimacula*, Richardson, *Rep. Brit. Assc. Adv. Sc.* (1845), p. 264.  
1849. *Belone caudimacula*, Cantor, *Journ. Asiat. Soc. Bengal* (1849), p. 1228.  
1851. *Belone caudimaculata*, Jerdon, *Madras Journ. Lit. Sc.*, p. 147.  
1853. *Belone caudimacula*, Bleeker, *Verh. Bat. Gen.*, XXV, p. 72.  
1865. *Belone caudimaculata*, Day, *Fish. Malabar*, p. 165.  
1866. *Mastacembelus strongylurus*, Bleeker, *Ned. Tijdsch. Dierk.*, III, p. 220.  
1866. *Belone strongylura*, Günther, *Cat. Fish Brit. Mus.*, VI, p. 246.  
1866. *Belone caudimaculata*, *Id.*, *ibid.*, p. 245.  
1872. *Mastacembelus strongylurus*, Bleeker, *Atl. Ich. Ind. Orient. Neerl.*, VI, p. 45, pl. cclvii, fig. 3.  
1878. *Belone strongylurus*, Day, *Fish. Ind.*, p. 512, pl. cxviii, fig. 6.  
1889. *Belone strongylura*, Day, *Faun. Brit. Ind. Fish.*, II, p. 421.  
1910. *Belone strongylura*, Jenkins, *Rec. Ind. Mus.*, V, p. 131.  
1913. *Belone strongylura*, Weber, *Fisch Siboga-Exped.*, p. 122.

There are ten specimens in the collection, the largest of which measures 410 mm. in length. It was collected at Parikud at the end of November, 1914. The rest vary from 224 mm. to 328 mm. in length and were collected at Satpara and Rambha Bay, mostly during the latter part of July, 1913. The species does not breed in the lake and appears to be only an occasional visitor to it.

*Distribution*:—Coasts and estuaries from Bengal to China; East Indian Archipelago and North Australia; in the river Brunai (Borneo) and in fresh water at Aleppee (Malay Peninsula).

Genus **HEMIRHAMPHUS**, Cuvier.**Hemirhamphus limbatus**, Cuvier and Valenciennes.

1846. *Hemirhamphus limbatus*, Cuvier and Valenciennes, *Hist. Nat. Poiss.*, XIX, p. 44.  
 1849. *Hemirhamphus tridentifer*, Cantor, *Journ. Asiat. Soc. Bengal* (1849), p. 1231.  
 1859. *Hemirhamphus brachynotopterus*, Blyth, *Proc. Asiat. Soc. Bengal* (1858), p. 288.  
 1878. *Hemirhamphus limbatus*, Day, *Fish. Ind.*, p. 516, pl. cxix, fig. 3.  
 1889. *Hemirhamphus limbatus*, Id., *Faun. Brit. Ind. Fish.*, II, p. 426.

There are eighty-eight specimens in the collection, many of which are quite young. They were obtained throughout the year and from all parts of the lake. The species is a permanent inhabitant and breeds in the lake at least twice in the year. In full-grown specimens the caudal fin is truncate in some and lunate in others; in most of the specimens the lower caudal lobe is the longer.

In Hamilton Buchanan's volume of manuscript drawings,<sup>1</sup> plate xcv is identified as a figure of *H. limbatus*, but it is not described anywhere by him.

The following statement gives the different localities whence the specimens were collected, and their number and size.

1 specimen	.. Off Balugaon	.. ..	6-iii-14	.. measuring 10 mm.
1	.. Between Barkuda Island and			
	the mainland	.. ..	16-vii-14	.. " 33 "
6 specimens	.. Off Barkul	.. ..	13-xi-12	.. " 42 " to 105 mm.
3	.. Chiriya Island	.. ..	17-xi-14	.. " 10 " to 11 "
1 specimen	.. Between Guntasila and Break-			
	fast Island	.. ..	23-xi-14	.. " 32 "
1	.. Off Guntasila	.. ..	18-xi-14	.. " 98 "
2 specimens	.. Off Kalidai	.. ..	5-iii-14	.. " 83 " and 95 mm.
2	.. " "	.. ..	21-ix-14	.. " 4 " and 8 "
10	.. " "	.. ..	22-xi-14	.. " 5 " to 10 mm.
17	.. Between Kalidai and Samalkuda		21-xi-14	.. " 4 " to 40 "
8	.. Off Kalupara Ghat..	.. ..	16-ix-14	.. " 40 " to 62 "
1 specimen	.. Off Nalbano	.. ..	18-ix-14	.. " 83 "
2 specimens	.. Off Manikpatna (close to sand			
	dunes opposite)	.. ..	3-ix-14	.. " 18 " and 61 mm.
8 specimens	.. Off Patsahanipur	.. ..	6-iii-14	.. " 10 " to 95 "
5	.. " "	.. ..	10-iii-14	.. " 53 " to 165 "
3	.. Rambha Bay	.. ..	Feb. 14	.. " 24 mm., 85 mm.
				and 99 mm.
5	.. " "	.. ..	15-ii-14	.. " 10 " to 15 mm.
11	.. " "	.. ..	23-ix-14	.. " 7 " to 18 "
1 specimen	.. Off Sankuda	.. ..	17-ii-14	.. " 140 "

This is one of the most extensively used food-fishes of the lake.

*Distribution*:—Indian Ocean; sea of Penang; this is by far the most common species on the Coromandal coast of India and extends to Burma; it is also found, but more rarely, on the Malabar coast; it ascends tidal rivers and is sometimes captured in fresh waters.

<sup>1</sup> Chaudhuri, *Mem. Ind. Mus.*, V, p. 444 (foot-note).

## Family MUGILIDAE.

## Genus MUGIL, Linnaeus.

**Mugil cephalus**, Linnaeus.

1758. *Mugil cephalus*, Linnaeus, *Syst. Nat.* Ed. X, p. 316.  
 1775. *Mugil Öür*, Forskål, *Descrip. Anim.*, p. xiv, no. 109c.  
 1788. *Mugil cephalus*, Bonnaterre, *Tabl. Encyclop.*, p. 179, pl. lxxiii, fig. ccciv.  
 1801. *Mugil cephalus*, Lacepede, *Hist. Poiss.*, V, p. 384.  
 1835. *Mugil Öür*, Ruppell, *Neu. Wirbel. Fisch.*, p. 131.  
 1836. *Mugil cephalotus*, Cuvier and Valenciennes, *Hist. Nat. Poiss.*, XI, p. 110.  
 1841. *Mugil cephalotus*, Eydoux and Souleyet, *Voy. Bonite, Zool.*, I, p. 175, pl. iv, fig. 4.  
 1842. *Mugil cephalotus*, Cantor, *Ann. Mag. Nat. Hist.*, IX, p. 484.  
 1845. *Mugil japonicus*, Temminck and Schlegel, *Faun. Japon.*, p. 134, pl. lxxii, fig. 1.  
 1845. *Mugil cephalotus*, Bleeker, *Nat. Geneesk. Arch. Ned. Ind.*, II, p. 514.  
 1846. *Mugil macrolepidotus*, Richardson, *Rep. Brit. Assc. Adv. Sc.* (1845), p. 249.  
 1861. *Mugil cephalotus*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 419.  
 1865. *Mugil cunnesius*, Day, *Fish. Malabar*, p. 136.  
 1868. *Mugil cephalotus*, Kner, *Reis. Oster. Novar. Fisch.*, p. 224.  
 1870. *Mugil oeur*, Klunzinger, *Verhand. zool. bot. Gesell. Wien*, XX, p. 829.  
 1878. *Mugil oeur*, Day, *Fish. Ind.*, p. 353, pl. lxxv, fig. 3.  
 1889. *Mugil oeur*, Id., *Faun. Brit. Ind. Fish.*, II, p. 348, fig. 114.  
 1903. *Mugil cephalus*, Fowler, *Proc. Acad. Nat. Sc. Philadel.*, LV, p. 743.  
 1907. *Mugil cephalus*, Jordan and Seale, *Proc. Davenport Acad. Sc.*, X, p. 4.  
 1911. *Mugil oeur*, Jordan and Richardson, *Mem. Carnegie Mus.*, IV, p. 176.  
 1916. *Mugil cephalus*, Waite, *Trans. Proc. Roy. Soc. South Australia*, XL, p. 453.

As yet no characters separating this Indian species from the cosmopolitan *Mugil cephalus* have been pointed out<sup>1</sup>; it is identical with the Japanese species *M. öœur*, *M. cephalotus* and *M. japonicus*.

There are seven specimens in the collection, the largest of which measures 309 mm. in length. It was secured at Nalbano on 25-xi-14; five specimens were obtained at Parikudh (21-31-vii-13), measuring 152 mm., 195 mm., 244 mm., 256 mm. and 261 mm. The remaining specimen was secured at the south end of the lake, its length being 208 mm.

The eyes of all the specimens appear slightly smaller than usual in the species. The species probably does not breed in the lake but is an occasional visitor to it.

*Distribution*:—The Pacific and the Atlantic coasts of America; the Mediterranean sea; coast of Madeira; west coast of Africa; Red sea; Polynesia and Indian Ocean; seas of China and Japan including estuaries and canals.

**Mugil gymnocephalus**, Swainson.

1803. *Mugil* sp. (*Bontak*), Russell, *Fish. Vizag.* II, p. 64, pl. clxxx.  
 1839. *Mugil gymnocephalus*, Swainson, Lardner's *Cab. Cyclop. Nat. Hist. (Fish. Amph. Rep.)*, II, p. 234.  
 1857. *Mugil belanak*, Bleeker, *Nat. Tijdsch. Ned. Ind.*, XIII, p. 337.

<sup>1</sup> Jordan and Seale, *Proc. Davenport Acad. Sc.* X, p. 4.

1861. *Mugil belanak*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 427.  
 1878. *Mugil belanak*, Day, *Fish. Ind.*, p. 351, pl. lxxiv, fig. 5.  
 1889. *Mugil belanak*, *Id.*, *Faun. Brit. Ind., Fish.*, II, p. 345.  
 1905. *Mugil belanak*, Fowler, *Proc. Acad. Nat. Sc. Philadel.*, LVII, p. 494, fig. 9.

Russell's figure and description of his *Bontah* (pl. clxxx), which he wrongly identified as *M. cephalus*, L., was adopted by Swainson in 1839 as representing his *M. gymnocephalus*. This name has, therefore, priority over the rest. Russell's name *Bontah* was adopted by Bleeker for his *Mugil bontah*<sup>1</sup>, but the latter placed specimens of another species under that name.<sup>2</sup> Day was misled by Russell's adoption of the name *Mugil cephalus* for his *Bontah* into the belief that this species was identical with *Mugil ôûr*, Forskål.

There is only one specimen in the collection. It measures 88 mm. in length and was obtained in the latter part of July, 1913. The fish is a casual visitor to the lake.

*Distribution* :—Seas of India ; coasts and rivers of the East Indian Archipelago ; Malay Archipelago.

#### *Mugil cunnesius*, Cuvier and Valenciennes.

1803. *Mugil* sp. (*Kunnese*), Russel, *Fish. Vizag.* II, p. 65, pl. clxxxii.  
 1836. *Mugil cunnesius*, Cuvier and Valenciennes, *Hist. Nat. Poiss.*, XI, p. 114.  
 1837. *Mugil cunnesius*, Ruppell, *Neu. Wirbel. Fisch.*, p. 131.  
 1839. *Mugil squamipinnis*, Swainson, Lardner's *Cab. Cyclop Nat. Hist. (Fish. Amph Rep.)*, II, p. 414.  
 1845. *Mugil cunnesius*, Bleeker, *Nat. Geneesk. Arch. Ned. Ind.*, II, p. 514.  
 1849. *Mugil cunnesius*, Cantor, *Journ. Asiat. Soc. Bengal*, p. 1082.  
 1858. *Mugil axillaris*, Bleeker, *Nat. Tijdsch. Ned. Ind.*, XVI, p. 280.  
 1861. *Mugil longimanus*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 428.  
 1861. *Mugil cunnesius*, *Id.*, *ibid.*, p. 434.  
 1865. *Mugil engli*, Day, *Fish. Malabar*, p. 139.  
 1878. *Mugil cunnesius*, Day, *Fish. Ind.*, p. 349, pl. lxxiv, fig. 3.  
 1889. *Mugil cunnesius*, *Id.*, *Faun. Brit. Ind. Fish.*, II, p. 342.  
 1909. *Mugil cunnesius*, Jenkins, *Rec. Ind. Mus.*, III, p. 287.  
 1910. *Mugil cunnesius*, *Id.*, *ibid.*, V, p. 133.

There are one hundred and seventy-six specimens in the collection. Of these one hundred and seventy four are very young, measuring from 35 mm. to 70 mm., and the remaining two are adult : *viz.* one from Satpara measuring 118 mm. in length, and one from Barkul measuring 129 mm. in length. The young specimens were caught in prawn-traps and nets during the third week of September, 1914. This fish evidently breeds in the lake, probably from the beginning of the breaking up of the monsoons. Cantor noted the young to be numerous at all seasons at Penang. The fish is a permanent inhabitant of the lake, in the main area as well as in the outer channel, breeding freely in the main area, at least at the commencement of the rains if not at "all seasons."

<sup>1</sup> Bleeker, *Verh. Bat. Genoot.*, XXV, p. 48 (1853).

<sup>2</sup> Bleeker, *Nat. Tijdsch. Ned. Ind.*, XIII, p. 336 (1857).

*Distribution* :—Abyssinia ; Red sea ; seas of India to the Malay Archipelago and beyond.

**Mugil subviridis**, Cuvier and Valenciennes.

1836. *Mugil subviridis*, Cuvier and Valenciennes, *Hist. Nat. Poiss.*, XI, p. 115.  
 1836. *Mugil dussumieri*, *Id.*, *ibid.*, p. 147,  
 1861. *Mugil subviridis*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 423.  
 1865. *Mugil subviridis*, Day, *Fish. Malabar*, p. 138.  
 1878. *Mugil dussumieri*, Day, *Fish. Ind.*, p. 352, pl. lxxiv, fig. 4.  
 1878. *Mugil subviridis*, *Id.*, *ibid.*, p. 353.  
 1884. *Mugil dussumieri*, *Id.*, *Faun. Brit. Ind. Fish.*, II, p. 347.  
 1889. *Mugil subviridis*, *Id.*, *ibid.*, p. 348.

There are three specimens in the collection, two from Satpara measuring 143 mm. and 130 mm. in length, the latter being secured in March, 1914. The remaining specimen, measuring 85 mm., was obtained at the mouth of Barkul Bay on the 18th September, 1917.

There is a manuscript figure (named *Mugil laevis* on the margin) in Hamilton Buchanan's drawings which represents this species.

This fish is found in the main area as well as in the outer channel and in all probability is a permanent inhabitant of the lake.

*Distribution* :—Seas of India, entering fresh water.

**Mugil caeruleo-maculatus**, Lacepede.

1798. *Mugil caeruleo-maculatus*, Lacépède, *Hist. Poiss.*, V, pp. 385, 389.  
 1836. *Mugil caeruleo-maculatus*, Cuvier and Valenciennes, *Hist. Nat. Poiss.*, XI, p. 128.  
 1860. *Mugil caeruleo-maculatus*, Bleeker, *Act. Soc. Sc. Indo-Neerl.*, VIII, Sumatra (IX), p. 5.  
 1861. *Mugil caeruleo-maculatus*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 445.  
 1878. *Mugil caeruleo-maculatus*, Day, *Fish. Ind.*, p. 356.  
 1889. *Mugil caeruleo-maculatus*, *Id.*, *Faun. Brit. Ind. Fish.*, II, p. 351.  
 1913. *Mugil bleekeri* (in part), Weber, *Fisch. Siboga-Exp.*, p. 139.

There is only one specimen in the collection. It measures 106 mm. in length and was obtained from the outer channel near Satpara in October, 1914. The species is in all probability an occasional visitor to the lake.

*Distribution* :—Coasts of Mauritius ; Bombay, through the seas of India to the Malay Archipelago.

**Mugil jerdoni**, Day.

1865. *Mugil sundanensis*, Day, *Fish. Malabar*, p. 138.  
 1878. *Mugil jerdoni*, Day, *Fish. Ind.*, p. 352.  
 1889. *Mugil jerdoni*, *Id.*, *Faun. Brit. Ind. Fish.*, II, p. 346.

There are only two specimens in the collection. They measure 105 mm. and 95 mm. in length. Both were secured at Rambha on 31-xii-14. The fish is probably a casual visitor to the lake and is found in the main area at least during the period of maximum salinity. It is a small-sized marine *Mugil* not growing bigger than six inches in length.

*Distribution* :—Seas of India.

**Mugil speigleri**, Bleeker.

1858. *Mugil speigleri*, Bleeker, *Act. Soc. Sc. Indo-Neerl.*, V, p. 2.  
 1860. *Mugil speigleri*, *Id.*, *ibid.*, VIII, p. 58.  
 1861. *Mugil speigleri*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 435.  
 1865. *Mugil suppositus*, Day, *Fish. Malabar*, p. 143.  
 1868. *Mugil axillaris*, Kner, *Reis. Oster. Novar. Fisch.*, p. 227, pl. ix, fig. 93.  
 1878. *Mugil speigleri*, Day, *Fish. Ind.*, p. 348, pl. lxxiv, fig. 1.  
 1889. *Mugil speigleri*, *Id.*, *Faun. Brit. Ind. Fish.*, II, p. 342.

There are four specimens in the collection: one from Satpara collected in September, 1914 measuring 110 mm., and three from Rambha obtained at the end of the month of December, 1914 measuring from 117 mm. to 130 mm. This fish is found in the outer channel after the floods are over, and in the main area of the lake in winter.

*Distribution*:—Seas of India; coasts of Java, Borneo and Halmaheira; Shanghai.

**Genus LIZA**, Jordan and Swain.<sup>1</sup>**Liza borneensis** (Bleeker).

1851. *Mugil borneensis*, Bleeker, *Nat. Tijd. Ned. Ind.*, II, p. 201.  
 1853. *Mugil adjustus*, *Id.*, *ibid.*, V, p. 503.  
 1861. *Mugil borneensis*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 448.  
 1878. *Mugil borneensis*, Day, *Fish. Ind.*, p. 357, pl. lxxvi, fig. 1.  
 1889. *Mugil borneensis*, Day, *Faun. Brit. Ind. Fish.*, II, p. 353, fig. 115.

There is only one specimen in the collection. It is from Satpara and measures 122 mm. in length. The time of capture is not given. The species appears to be an occasional visitor to the outer channel.

*Distribution*:—Seas of India; East Indian and Malay Archipelagoes.

**Liza corsula** (Hamilton Buchanan).

1822. *Mugil corsula*, Hamilton Buchanan, *Fish. Ganges*, pp. 222 and 381, pl. ix, fig. 97.  
 1836. *Mugil corsula*, Cuvier and Valenciennes, *Hist. Nat. Poiss.*, XI, p. 119.  
 1841. *Mugil corsula*, Eydoux and Souleyet, *Voy. Bonite, Zool.*, I, p. 172, pl. iv, fig. 2.  
 1853. *Mugil corsula*, Bleeker, *Verh. Bat. Gen.*, XXV, p. 101.  
 1860. *Mugil corsula*, *Id.*, *Act. Soc. Sc. Indo-Neerl.*, VII, p. 82.  
 1861. *Mugil corsula*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 460.  
 1878. *Mugil corsula*, Day, *Fish. Ind.*, p. 354, pl. lxxi, fig. 6.  
 1889. *Mugil corsula*, *Id.*, *Faun. Brit. Ind. Fish.*, II, p. 340.  
 1910. *Mugil corsula*, Jenkins, *Rec. Ind. Mus.*, V, p. 140.

Only one young specimen, 40 mm. in length, is in the collection. It was caught on 16-ix-14 in the north-east portion of the lake about eight miles south-east of Kalupara Ghat, at a point where the depth of the water was eight feet. This specimen was mixed up with other young mullets and its presence was detected only on a minute examination of the specimens. It is remarkable that this species should be represented only by one very young specimen. Probably it entered the lake along with flood-water from the rivers during July, which, judging from the size

<sup>1</sup> *Proc. U. S. Nat. Mus.*, VII, p. 261 (1884), and *Proc. Acad. Nat. Sc. Philadelphia*, LV, p. 746 (1903).



of the specimen, was about the time when the mother-fish spawned. The species is, however, very common in the brackish and fresh waters of Orissa and individuals are often noticed even in *nayan jhuris* (road-side drains). This fish is proverbially clever in eluding capture and special traps are constructed to secure it. It is not improbable, therefore, that specimens in the lake escape capture. The presence of the species after the freshets is, however, well established, as this individual was captured at a considerable distance from the mouth of any river.

*Distribution* :—Estuaries and rivers of Bengal, Bihar and Orissa, United Provinces and Burma, found far above tidal influence in fresh water.

### *Liza troschelii* (Bleeker).

1858. *Mugil troschelii*, Bleeker, *Nat. Tijdsch. Ned. Ind.*, XVI, p. 277.  
 1859. *Mugil troschelii*, *Id.*, *Act. Soc. Sc. Indo-Neerl.*, VIII, *Sumatra* (8), p. 80.  
 1861. *Mugil troschelii*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 448.  
 1878. *Mugil troschelii*, Day, *Fish. Ind.*, p. 358.  
 1889. *Mugil troschelii*, *Id.*, *Faun. Brit. Ind. Fish.*, II, p. 355.  
 1911. *Liza troscheli*, Jordan and Richardson, *Mem. Carnegie Mus.*, IV, p. 176.  
 1913. *Mugil troschelii*, Weber, *Fisch. Siboga-Exped.*, p. 139.

There is only one specimen in the collection, 107 mm. in length. It was secured at Satpara ; the time of capture is not stated. Probably the fish is only a casual visitor to the outer channel.

*Distribution* :—Seas of India ; coasts of Ceylon, Java, Sumatra and Borneo.

### Family POLYNEMIDAE.

#### Genus ELEUTHERONEMA, Bleeker.

#### *Eleutheronema tetradactylum* (Shaw).

1803. *Polynemus* sp. (*Maga Jelle*), Russell, *Fish. Vizag.* II, p. 67, pl. clxxxiii.  
 1804. *Polynemus tetradactylus*, Shaw, *Gen. Zool.*, V, p. 135.  
 1822. *Polynemus teria*, Hamilton Buchanan, *Fish. Ganges*, pp. 224 and 381.  
 1829. *Polynemus tetradactylus*, Cuvier and Valenciennes, *Hist. Nat. Poiss.*, III, p. 375, and VII, p. 514.  
 1839. *Polynemus tetradactylus*, McClelland, *Journ. Asiat. Soc. Bengal*, VIII, p. 206.  
 1839. *Polynemus salliah*, Cantor, *Journ. Roy. Asiat. Soc.*, V, p. 166.  
 1839. *Polynemus quadrifilis*, *Id.*, *ibid.*, p. 186.  
 1846. *Polynemus tetradactylus*, Richardson, *Rep. Brit. Assoc. Adv. Sc.* (1845), p. 218.  
 1849. *Polynemus tetradactylus*, Cantor, *Journ. Asiat. Soc. Bengal*, p. 1007.  
 1849. *Polynemus tetradactylus*, Bleeker, *Verh. Batav. Gen.*, XXIII, p. 57.  
 1860. *Polynemus tetradactylus*, Günther, *Cat. Fish. Brit. Mus.*, II, p. 329.  
 1878. *Polynemus tetradactylus*, Day, *Fish. Ind.*, p. 180.  
 1880. *Polynemus tetradactylus*, Klunzinger, *Sitzb. Akad. Wien*, LXXX, p. 373.  
 1889. *Polynemus tetradactylus*, Day, *Faun. Brit. Ind. Fish.*, II, 106.  
 1903. *Polydactylus rhadinus*, Jordan and Evermann, *Proc. U. S. Nat. Mus.*, XXV, p. 351, fig. 20.  
 1907. *Polynemus tetradactylus*, Lloyd, *Rec. Ind. Mus.*, I, p. 224.  
 1911. *Eleutheronema tetradactylum*, Jordan and Richardson, *Mem. Carnegie Mus.*, IV, p. 177, fig. 10.  
 1913. *Polynemus tetradactylus*, Weber, *Fisch. Siboga-Exped.*, LVII, p. 141.

There are eleven specimens in the collection, among which one from Rambha is fairly large, measuring 430 mm. in length. The species is found throughout the main area of the lake and is a permanent resident, probably breeding near the mouths of rivers before the rains. The following statement shows the different localities whence the specimens were obtained, and their number and size.

2 specimens	..	Off Balugaon	..	21-vii-13	..	130 mm. and 136 mm.
4	..	Barkul Bay	..	18-ix-14	..	77 mm., 86 mm., 97 mm. and 115 mm.
1 specimen	..	Off Barkul	..	—	..	121 mm.
3 specimens	..	8 miles S. E. of Kalupara				
		Ghat	..	16-ix-14	..	68 ,, to 69 mm.
1 specimen	..	Rambha	..	19-xi-14	..	430 ,,

*Distribution* :—Seas of India ; China ; Indo-Australian Archipelago ; North-Australia ; this species ascends higher up the rivers than any other of the family.

#### Family SPHYRAENIDÆ.

#### Genus SPHYRAENA, Artedi.

#### *Sphyraena raghava*, sp. nov.

(Text-figures 20, 21.)

The body is elongated and round but a little compressed and is also slightly constricted near the end of the caudal peduncle. The dorsal profile is almost straight ; the ventral profile is slightly convex to the anterior origin of the anal fin, posterior to which it runs up, narrowing down the depth of the fish to the constricted portion of the caudal peduncle.

The measurements in hundredths of the length without the caudal fin are as follows : the length of the head 31 %, the height of the body 14.3 %, the length of the snout 15.24 %, the horizontal diameter of the eye 5.24 %, the length of the maxillary 13 %, the breadth of the interorbital space 4.7 %, the length of the pectoral fin 10.95 %, the length of the ventral fin 7.6 %, and the least depth of the caudal peduncle 7.14 %.

The distance between the occiput and the anterior origin of the first dorsal fin is equal to the length of the snout ; the distance between the anterior origin of the first dorsal fin and the anterior origin of the second dorsal fin is equal to the distance between the anterior origin of the second dorsal fin and the commencement of the caudal fin rays on the superior side of that fin ; the distance between the anterior origin of the second dorsal fin and the root of the caudal fin about its middle is equal to the length of the head. The depth of the body is contained seven times in the length without the caudal fin. The least height of the caudal peduncle is half the depth of the body and is contained two and two-thirds times in the length of the caudal peduncle.

The head is long and tapering and is as high as broad. The upper and the lower profiles of the head are straight and the end is pointed. The length of the head measured from the tip of the mandible is contained three and one-fifth times in the length without the caudal fin, and the height of the head, which is equal to the width of the

head and the post-orbital length of the head, is contained three and one-fourth times in the length of the head. The snout is contained twice in the length of the head. The lower jaw is longer than the upper by half the length of the longer diameter of the eye. On the upper side of the free pointed end of the lower jaw there is a fleshy cushion-like protuberance, which is continued over the tip down to the lower surface of the protruded end of that jaw. The anterior end of the upper jaw is truncated and thus fits behind the fleshy cushion on the upper side of the tip of the lower jaw. The skin on the superior side of the truncated end of the upper jaw is finely striated. The eye is large, lateral and ovate; the anterior end of the eye is wider, the vertical diameter being a little more than three-fourths of the horizontal diameter, which is contained six times in the length of the head. The lower margin of the orbit is lower than the middle of the depth of the head. The eyes have adipose eye-lids. The breadth of the interorbital space about the middle of the eyes is contained six and a half times in the length of the head. This space is slightly concave and there are two ridges running through the interorbital space from the end of the snout to the occiput, running more and more apart either way than in the middle of the eyes. The

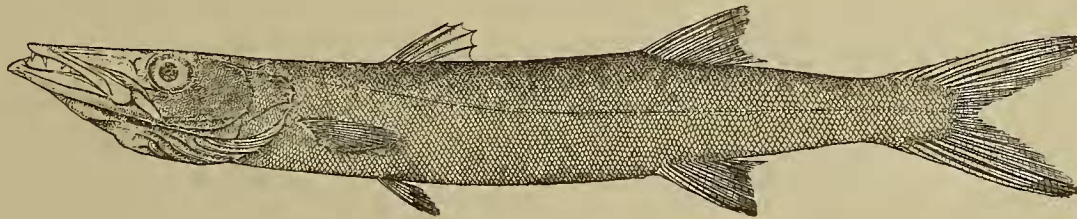


FIG. 20.—*Sphyraena raghava*, Chaudhuri  $\times \frac{1}{2}$ .

two pairs of nostrils are close together, the posterior nostrils are lateral, are in the form of vertically inclined slits and are provided with skin flaps, which are one-third of the vertical diameter of the eye in advance of the anterior orbit; the anterior nostrils are superior in position and are closer together, with tubular openings and are in advance of the anterior orbit by half the horizontal diameter of the eye. The free posterior end of the maxillary is dilated and round and reaches below the posterior nostril of its side; there is a triangular process on the maxillary bone above the angle of the jaws which ends in a bony knob.

The teeth in the jaws are uniserial. At the symphysis of the mandible, just posterior to the fleshy tubercle, there is a pair of large fang-like teeth, placed side by side very close to each other, and inclined together at an acute angle and directed inwards. There is a large round and deep groove correspondingly above at the symphysis of the upper jaw for the lodgment of this pair of canine-like teeth when the mouth is shut. On each side of this pair of teeth, there is an empty round and smooth interval in the jaw on each ramus of the lower jaw, beyond which there are eight minute conical teeth in a single line placed close to one another; posterior to these small teeth there are seven or eight large conical teeth of various sizes quite wide apart from one another, the size of the one further inward being larger than the one

nearer to the symphysis. In the upper jaw, in the front part of the snout, on each side of the large groove at the symphysis already described, there are two large and long fang-like teeth on each side of the groove with a considerable empty interval between. On a higher level to these four fangs there are minute villiform teeth, forty-five in number, on each side on the edges of the premaxillary throughout its length, which continue to the angle of the jaws (as the maxillary bone does not take any part in the formation of the mouth). Further inward and at a lower level, but running parallel to the villiform teeth of the premaxillary, there are on each side a series of palatine teeth beginning behind and beyond the four anterior fang-like teeth. Of these palatine teeth on each side there are four large conical teeth wide apart from one another; posterior to these large conical teeth, but in the same line with them, there are five very small teeth on each side, not very close to one another (fig. 21).

The tongue is not free but is attached to the floor of the mouth about its middle;

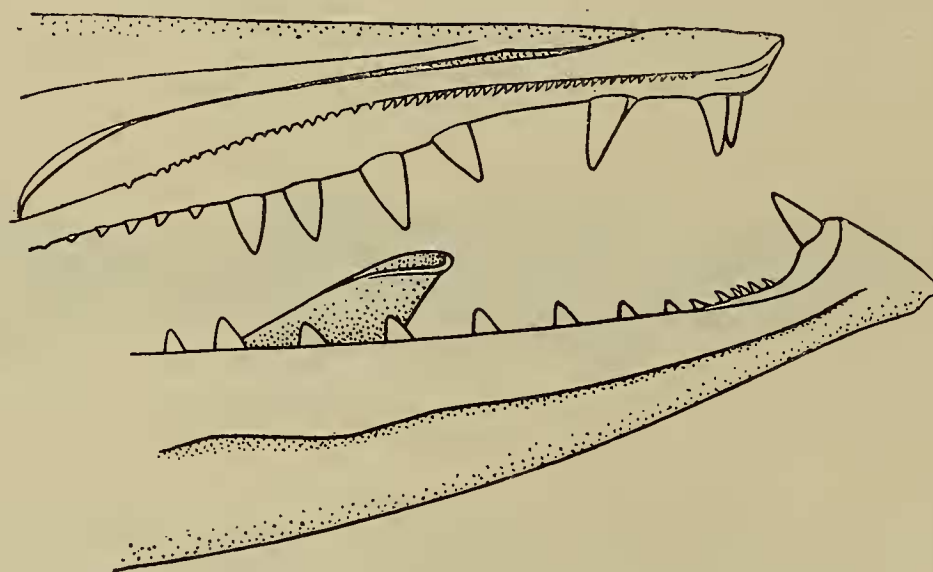


FIG. 21.—*Sphyræna raghava*, Chaudhuri. Teeth of palate, upper and lower jaw.

it is long, slender, and pointed; the upper surface of the tip of the tongue is finely asperous and there are very minute teeth on this surface arranged in longitudinal series.

There are seven branchiostegal rays and the gill openings are wide; the gill rakers are entirely absent and are only represented by the asperities opposite the gill filaments. The pseudo-branchiae are well developed and have about fifty-two filaments, most of which are longer than half the length of the gill filaments. The end of the isthmus is in the form of a hard bony knob. The edge of the operculum is round and is without any spinous process or point.

The dorsal fin has four spines, probably there was another which possibly might have been damaged beyond recognition; the second dorsal fin has one short and slender spine and nine soft rays; the pectoral fin has fourteen rays; the ventral fin has one strong spine and six rays; the anal fin has two spines and nine rays. The distance between the root of the pectoral fin and the anterior origin of the first dorsal

fin is less than the length of the pectoral fin by nearly one-fifth the length of the latter fin ; the insertion of the ventral fin is almost vertically below the anterior origin of the first dorsal fin ; the distance between the root of the ventral fin and the anterior margin of the anal fin is almost equal to the interval between the anterior roots of the two dorsal fins. The anal opening is in advance of the anterior root of the anal fin by half the length of the vertical diameter of the eye. The caudal fin is deeply divided, the length of the middle rays is contained three times in the length of the longest outer caudal rays ; the upper caudal lobe is slightly longer than the lower one.

The scales are small and the head is more or less covered with scales smaller than those on the body. The preorbital, the frontal, and the parietal regions are bare, but the suborbital, the temporal, the occipital, the preopercular and the opercular regions are thickly covered with minute scales. The number of vertical rows of scales on the cheek (below the eye) is nine and the number of vertical rows on the opercle eighteen. The lateral line is complete ; it runs from the upper edge of the gill-opening to the middle point of the base of the caudal fin, consisting of rather large scales perforated by simple tubes ; from the upper corner of the opercular opening the lateral line continues straight along seven scales, then curving a little it slopes below the middle line which it meets traversing forty-three scales ; from this point it continues in a straight line to the root of the caudal fin terminating at the middle point ; the number of perforated scales in the lateral line is one hundred and forty-four. In the transverse lateral series there are eleven rows of scales between the first dorsal fin and the lateral line and twenty-five rows of scales between the lateral line vertically below the anterior origin of the first dorsal fin and the midventral line [*i.e.* lat. trans. at the first dorsal fin, is 11/25], between the second dorsal fin and the lateral line there are sixteen rows of scales, and between the lateral line at the point in the line directly below the anterior origin of the second dorsal fin and the midventral line there are fifteen rows of vertical scales [*i.e.* lat. trans. at the second dorsal fin, is 16/15]. The number of lateral rows of scales, between the anterior origin of the first dorsal fin and the ventral fin of the same side, is thirty-five.

The colour of the specimens in alcohol is brown above the lateral line, and dull silvery white below that line including the abdomen. The fins are pale brown and, except the ventral fins, the inner margins of the fins are tinted black. The tip of the lower jaw with the fleshy protuberance is coloured black. The upper margins of the rims of the eyes are also black. The roots of the dorsal fins, specially of the second dorsal, are coloured black. On the side of the body there are short and thick but faint oval patches, six or seven in number, along the middle line below the two dorsal fins. These faint marks are only visible in shaded light. The tip of the tongue and the top of the end of the upper jaw are dark.

The new species differs from all the known Indian species by possessing a very large number of scales in the lateral line as well as in the proportions of the different parts and in the position of the fins. The new fish has a longer head than *S. yellow*, *S. acutipinnis*, *S. commersonii* and *S. obtusata* ; it is of lesser height and has smaller

eyes than *S. obtusata*. In the number of scales in the lateral line it approaches *Sphyaena sphyaena* (L.), more commonly known as *Sphyaena vulgaris*, which has one hundred and fifty scales in the lateral line against one hundred and forty-four in the new species; the new species is a deeper fish than *S. sphyaena* and possesses larger eyes. From all the recently described species of the genus it differs considerably. From *S. africana*, Gilchrist,<sup>1</sup> it differs in the character of its teeth, in possessing a smaller eye and a shorter maxillary, in having the pectoral fin not ending below the origin of the spinous dorsal and not having the ventrals in advance of the origin of the first dorsal, besides other differences. *S. ensis*, Jordan and Gilbert,<sup>2</sup> has a longer head, a less deep body, a larger eye and longer maxillary. *S. goodingi*, Seale,<sup>3</sup> is much less deep, possesses short gill-rakers (gill-rakers are absent in the new species) and differs in the position of the fins. *S. pelleri*, Jenkins,<sup>4</sup> has longer eyes and is much less deep than the new species and differs in the number of rows of scales on the cheek. *S. putnamiae*, Jordan and Seale,<sup>5</sup> differs in the length of the maxillary and also in the character of the teeth, in the proportions of the fins and in colouration.

The new species differs from *S. pinguis*, Günther,<sup>6</sup> in the character of the tip of the lower jaw, in the position of the fins and in the number of scales in the lateral line. *S. snodgrassi*, Jenkins,<sup>7</sup> has a larger eye, longer maxillary and a smaller number of scales in the lateral line. *S. tome*, Fowler,<sup>8</sup> differs in the depth of the body, in the number of scales in the lateral and transverse lines, in the width of the head and in the depth of the caudal peduncle, etc. *S. waitii*,<sup>9</sup> Ogilby, differs in every particular except in the height of the body and the length of the head.

The type-specimen was collected at Satpara in the outer channel of the lake. The period of its capture is not noted. Evidently the species is an occasional visitor to the part of the lake that is nearest to the sea. The type is 210 mm. in length without the caudal fin and is entered in the register of the Zoological Survey of India under No. F. 9453/1.

#### Family OPHIOCEPHALIDAE.

#### Genus OPHICEPHALUS, Bloch.

#### *Ophicephalus punctatus*, Bloch.

1801. *Ophicephalus punctatus*, Bloch, *Ichth.*, X, p. 114, pl. cccviii.  
 1803. *Ophiocephalus karrouvei*, Lacepede, *Hist. Poiss.*, III, p. 554.  
 1822. *Ophiocephalus lata*, Hamilton Buchanan, *Fish. Ganges*, pp. 63 and 367.  
 1831. *Ophicephalus punctatus*, Cuvier and Valenciennes, *Hist. Nat. Poiss.*, VII, p. 404.

<sup>1</sup> Gilchrist, *Ann. South African Mus.*, VI, p. 256 (1908-10).

<sup>2</sup> Jordan and Gilbert, *Bull. U. S. Fish. Com.*, II, p. 106 (1882).

<sup>3</sup> Seale, *Occasional Papers Ber. Pau. Bishop Mus. Honolulu*, IV, p. 18 (1906).

<sup>4</sup> Jenkins, *Bull. U. S. Fish. Com.*, XIX, p. 387 (1899).

<sup>5</sup> Jordan and Seale, *Proc. Davenport Acad. Sc.*, X, p. 4, pl. xiii (1907).

<sup>6</sup> Günther, *Journ. Mus. Godeffroy*, II, p. 211 (1873).

<sup>7</sup> Jenkins, *Bull. U. S. Fish. Com.*, XIX, p. 387 (1899).

<sup>8</sup> Fowler *Proc. Acad. Nat. Sc. Philadelphia*, LV, p. 750, pl. xlvi (1903).

<sup>9</sup> Ogilby, *Ann. Queensland Mus.*, IX, p. 29 (1908).

1842. *Ophicephalus indicus*, M'Clelland, *Cal. Journ. Nat. Hist.*, II, p. 583.  
 1848. *Ophiocephalus punctatus*, Jerdon, *Madras Journ. Lit. Sc.*, p. 145.  
 1853. *Ophiocephalus punctatus*, Bleeker, *Verh. Bat. Gen.*, XXV, p. 95.  
 1861. *Ophiocephalus punctatus*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 469.  
 1861. *Ophiocephalus affinis*, *Id.*, *ibid.*, p. 470.  
 1865. *Ophiocephalus punctatus*, Day, *Fish. Malabar*, p. 151.  
 1878. *Ophiocephalus punctatus*, *Id.*, *Fish. Ind.*, p. 367, pl. lxxviii fig. 1.  
 1889. *Ophiocephalus punctatus*, *Id.*, *Faun. Brit. Ind. Fish.*, II, p. 364.  
 1909. *Ophiocephalus punctatus*, Jenkins, *Rec. Ind. Mus.*, III, p. 287.  
 1910. *Ophiocephalus punctatus*, *Id.*, *ibid.*, V, p. 138.  
 1911. *Ophiocephalus punctatus*, Chaudhuri, *ibid.*, VI, p. 23.

There are two specimens in the collection ; one measuring 148 mm. in length is from Parikud. The other, 108 mm. in length, was secured in the month of September, 1914 at Barkul. In Parikud the fish was probably introduced through human agency. The presence of the fish in September near Barkul, when the water of this part of the lake is almost fresh, is easily accounted for.

*Distribution* :—Fresh waters of the East Indian continent and of Ceylon ; Yunnan.

#### Suborder PLECTOGNATHI.

#### Division SCLERODERMI.

#### Family TRIACANTHIDAE.

#### Genus TRIACANTHUS, Cuvier.

#### *Triacanthus brevirostris*, Temminck and Schlegel.

1754. *Balistes* sp., Gronovius, *Mus. Ichthyol.*, I, p. 52, pl. cxv.  
 1763. *Balistes bipes*, Gronovius, *Zoophyl.*, p. 53, pl. cccxciv.  
 1803. *Balistes* sp. (*Bowree and Abatoo*), Russell, *Fish. Vizag.*, I, p. 14, pl. xxi.  
 1830. *Balistes biaculeatus*, Bennett, *Fish. Ceylon*, p. 15, pl. xv.  
 1849. *Triacanthus biaculeatus*, Cantor, *Journ. Asiat. Soc. Bengal*, p. 1342.  
 1850. *Triacanthus brevirostris*, Temminck and Schlegel, *Faun. Japon. Pisces.*, p. 294, pl. cxxix, fig. 2.  
 1854. *Balistes bipes*, Gronovius and Gray, *Cat. Fish. Brit. Mus.*, p. 37.  
 1854. *Triacanthus brevirostris*, Hollard, *Ann. Sc. Nat.*, I, p. 45, pl. ii, fig. 1.  
 1865. *Triacanthus biaculeatus*, Day, *Fish. Malabar*, p. 260.  
 1870. *Triacanthus brevirostris*, Günther, *Cat. Fish. Brit. Mus.*, VIII, p. 210.  
 1878. *Triacanthus brevirostris*, Day, *Fish. Ind.*, p. 685, pl. clxxv, fig. 1.  
 1889. *Triacanthus brevirostris*, *Id.*, *Faun. Brit. Ind. Fish.*, II, p. 471, fig. 170.  
 1903. *Triacanthus brevirostris*, Regan, *Proc. Zool. Soc.*, I, pp. 181 and 183.  
 1910. *Triacanthus brevirostris*, Annandale and Jenkins, *Mem. Ind. Mus.*, III, pp. 8 and 11.  
 1910. *Triacanthus brevirostris*, Jenkins, *Rec. Ind. Mus.*, V., p. 136.  
 1912. *Triacanthus brevirostris*, *Id.*, *ibid.*, VII, p. 6.

The specific name "*bipes*" by Dr. Laurence Theodore Gronow is the earliest, reported to be written before 1777 and said to be published in 1780. The species was described by Gronow as early as 1754 (*Mus. Ichthyol.*<sup>1</sup>).

<sup>1</sup> "Catalogue of Fish collected and described by Laurence Theodore Gronow now in the British Museum." Published by order of the Trustees, in 1854; edited by J. E. Gray, pp. v-vii and 37.

There are fifty-seven specimens in the collection. This fish occurs very extensively all over the lake and breeds freely everywhere at least from February to September. Numerous young measuring 12 mm. and upwards were secured in March, June, July and September. Some of the young have black or grey blotches or stripes. The following statement shows the different localities in the lake whence the specimens were obtained, and their number and size.

2 specimens	..	Off Balugaon ..	..	21-vii-13 ..	..	28 mm. and 40 mm.
9	..	Off Barkul ..	..	13-xi-12 ..	..	24 ,, to 56 ,,
3	..	Between Chiriya Island and Barkuda Island ..	..	17-xi-14 ..	..	255 ,, to 275 ,,
10	..	Between Domkuda and Sa- mal Island ..	..	July, 1914 ..	..	12 ,, to 23 ,,
3	..	Off Nalbano ..	..	Sept. 1914 ..	..	24 ,, to 53 ,,
1 specimen	..	South East of Patsahanipur	..	6-iii-14 ..	..	12 ,,
1	..	Rambha Bay ..	..	— ..	..	86 ,,
21 specimens	..	Off Samal Island ..	..	22-ix-13 ..	..	11 ,, to 47 ,,
6	..	Seruanaddi near Barnikuda	..	4-ix-14 ..	..	17 ,, to 46 ,,
1 specimen	..	Seruanaddi ..	..	8-ix-14 ..	..	46 mm.

This fish is eaten by the Uriyas among whom it commands a very extensive sale and is extremely cheap; it is very popular with the poorer classes of the people round the lake; even the skin, spines and bones separately find a ready market.

*Distribution*:—Seas of India, of the Malay Archipelago, China and Japan; also Australia.

#### Division *GYMNODONTES*.

#### Family TETRODONTIDAE.

#### Genus **TETRODON**, Linnaeus.

#### **Tetrodon fluviatilis**, Hamilton Buchanan.

1822. *Tetrodon fluviatilis*, Hamilton Buchanan, *Fish. Ganges*, pp. 6 and 362, pl. xxx, fig. 1.  
 1823. *Tetrodon nigroviridis*, Procé, *Bull. Soc. Philom.* (1822), p. 130.  
 1849. *Tetrodon simulans*, Cantor, *Journ. Asiat. Soc. Bengal*, p. 1356.  
 1860. *Arothron dorsovittatus*, Blyth, *ibid.*, XXIX, p. 173.  
 1865. *Crayracion fluviatilis*, Bleeker, *Atl. Ichthyol. Ind. Orient. Neerl.*, p. 68, pl. ccx, fig. 4.  
 1865. *Crayracion fluviatilis*, Day, *Fish. Malabar*, p. 256.  
 1870. *Tetrodon fluviatilis*, Günther, *Cat. Fish. Brit. Mus.*, VIII, p. 299.  
 1878. *Tetrodon fluviatilis*, Day, *Fish. Ind.*, p. 707, pl. clxxxiii, fig. 1.  
 1889. *Tetrodon fluviatilis*, Id., *Faun. Brit. Ind. Fish.*, II, p. 496.  
 1902. *Tetrodon fluviatilis*, Regan, *Proc. Zool. Soc.*, 1902 (ii), p. 284.  
 1910. *Tetrodon fluviatilis*, Annandale and Jenkins, *Mem. Ind. Mus.*, III, pp. 8 and 15.

There are only three young specimens in the collection, one measuring 44 mm. in length caught off Nalbano in September, 1914 and two measuring 70 mm. and 72 mm. in length from Rambha Bay in February, 1914. The fish is probably a permanent inhabitant in the main area of the lake and breeds in it.

*Distribution*:—Seas and estuaries of India and the Malay Archipelago. This



species appears to be entirely littoral, estuarine and fluviatile. It ascends tidal rivers and has been reported as far up as Saraghat in the Ganges. In the Amherst District of Burma it is said to be found in hill streams.

### **Tetrodon oblongus** (Bloch).

1785. *Tetraodon oblongus*, Bloch, *Ausl. Fisch.*, II, p. 6, pl. cxlvi, fig. 1.  
 1801. *Tetraodon oblongus*, Bloch and Schneider, *Syst. Ichthyol.*, p. 504.  
 1803. *Tetraodon* sp. (*Kappa*), Russell, *Fish. Vizag.*, I, p. 17, pl. xxiv.  
 1846. *Tetrodon alboplumbeus*, Richardson, *Voy. Sulph. Ichthyol.*, p. 121, pl. lviii, figs. 6 and 7.  
 1846. *Tetrodon alboplumbeus*, *Id.*, *Rept. Brit. Assoc. Adv. Sc.* (1845), p. 199.  
 1849. *Tetrodon oblongus*, Cantor, *Journ. Asiat. Soc. Bengal* (1849), p. 1362.  
 1860. *Gastrophysus microphthalmus*, Blyth, *Journ. Asiat. Soc. Bengal*, XXIX, p. 174.  
 1870. *Tetrodon oblongus*, Günther, *Cat. Fish. Brit. Mus.*, VIII, p. 278.  
 1878. *Tetrodon oblongus*, Day, *Fish. Ind.*, p. 702, pl. clxxx, fig. 2.  
 1889. *Tetrodon oblongus*, *Id.*, *Faun. Brit. Ind. Fish.*, II, p. 492.  
 1910. *Tetrodon oblongus*, Annandale and Jenkins, *Mem. Ind. Mus.*, III, pp. 8 and 14.

There is only one young specimen in the collection measuring 67 mm. in length; locality and date of capture are not noted. Probably the fish is a chance visitor to the outer channel.

*Distribution*:—Seas of India; Indian Ocean; Malay Archipelago; China, Japan and the South Sea.

### **Tetrodon patoca**, Hamilton Buchanan.

1803. *Tetraodon* sp. (*Kappa*), Russell, *Fish. Vizag.*, p. 18, pl. xxv.  
 1822. *Tetrodon patoca*, Hamilton Buchanan, *Fish. Ganges*, pp. 7 and 363, pl. xviii, fig. 2.  
 1849. *Tetrodon dissutidens*, Cantor, *Journ. Asiat. Soc. Bengal* (1849), p. 1364.  
 1855. *Tetrodon patoca*, Duméril, *Rev. Zool.*, p. 280.  
 1865. *Leiodon patoca*, Bleeker, *Atl. Ichthyol. Ind. Orient. Neerl.* V, p. 76, pl. vi, fig. 2.  
 1870. *Tetrodon patoca*, Günther, *Cat. Fish. Brit. Mus.*, VIII, p. 288.  
 1878. *Tetrodon patoca*, Day, *Fish. Ind.*, p. 703, pl. clxxxii, fig. 4.  
 1889. *Tetrodon patoca*, *Id.*, *Faun. Brit. Ind. Fish.*, II, p. 492.  
 1910. *Tetrodon patoca*, Annandale and Jenkins, *Mem. Ind. Mus.*, III, p. 14.

There are three specimens in the collection all of which are young, measuring 12 mm., 13 mm. and 25 mm. in length. They were collected in the latter half of the month of March, 1913 and 1914 in Satpara Bay and near Satpara. Probably the fish comes as far as the outer channel and breeds in the neighbourhood in February and March, when the water is nearly as salt as the sea outside.

*Distribution*:—From Sind through the seas of India to China. The fish is very common along the Coromandel coast. The species is also common in the estuaries of the Ganges.

### **Tetrodon reticularis** (Bloch and Schneider).

1785. *Tetraodon testudineus*, Bloch, *Ausl. Fisch.*, I, p. 123, pl. cxxxix.  
 1801. *Tetraodon testudineus*, Bloch and Schneider, *Syst. Ichthyol.*, p. 502.  
 1801. *Tetraodon reticularis*, *Id.*, *ibid.*, p. 506.  
 1803. *Tetraodon* sp. (*Bondaroo Kappa*), Russell, *Fish. Vizag.*, I, p. 19, pl. xxvii.  
 1804. *Tetraodon testudineus*, Shaw, *Gen. Zool.*, V, p. 444, pl. clxxviii.

1849. *Tetrodon testudineus*, Cantor, *Journ. Asiat. Soc. Bengal* (1849), p. 1358.  
1865. *Crayracion testudineus*, Bleeker, *Atl. Ichthyol. Ind. Orient. Neerl.*, V, p. 71, pl. ccxii, fig. 3.  
1865. *Crayracion testudineus*, Day, *Fish. Malabar*, p. 257.  
1870. *Tetrodon reticularis*, Günther, *Cat. Fish. Brit. Mus.*, VIII, p. 296.  
1878. *Tetrodon reticularis*, Day, *Fish. Ind.*, p. 705, pl. clxxx, fig. 5.  
1889. *Tetrodon reticularis*, Id., *Faun. Brit. Ind. Fish.*, II, p. 494.  
1910. *Tetrodon reticularis*, Annandale and Jenkins, *Mem. Ind. Mus.*, III, p. 8.

There are only two specimens in the collection, one measuring 145 mm. in length secured in March, 1914 near Satpara, and the other measuring 112 mm. in length obtained in the channel between Barnikuda and Satpara on 4-ix-14. Probably the fish is an occasional visitor to the outer channel when the salinity of the area is sufficiently high.

*Distribution* :—Seas of India, Malay Archipelago and New Guinea.

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